

Case Report

Postpartum Endocarditis and Left Main Embolization

Negar Atefi, BSc,^{a,‡} Carly Lodewyks, MD, MSc,^{b,‡} Zubair Luqman, MD, FRCSC,^{b,‡} and Amir Ravandi, MD, PhD, FRCPC^{a,‡}

^a Section of Cardiology, Max Rady College of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada

^b Section of Cardiac Surgery, Max Rady College of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada

ABSTRACT

Postpartum infective endocarditis is a rare disease, especially in people with no risk factors (ie, intravenous drug use), that can be followed by severe morbidity and mortality. Here, we report a case of postpartum infective endocarditis with an unusual acute coronary syndrome-like presentation in a patient with minimal risk factors. In addition to lesions on the aortic valve causing severe aortic insufficiency, the patient's case was also complicated by left main coronary artery embolization, which was subsequently aspirated during surgery. Repeat angiography demonstrated complete removal, with no evidence of downstream embolization.

RÉSUMÉ

L'endocardite infectieuse du post-partum est une maladie rare, en particulier en l'absence de facteur de risque (comme l'utilisation de drogues intraveineuses), qui peut être une cause de morbidité grave ou de mortalité. Nous décrivons ici un cas d'endocardite infectieuse du post-partum caractérisé par des symptômes inhabituels s'apparentant à un syndrome coronarien aigu, chez une patiente présentant peu de facteurs de risque. En plus de lésions de la valve aortique entraînant une insuffisance aortique grave, le cas de cette patiente a été compliqué par une embolie de l'artère coronaire gauche principale, traitée ultérieurement par aspiration au cours du traitement chirurgical. Une angiographie post-intervention a révélé la disparition complète des lésions sans signe d'embolie en aval.

Early postpartum infective endocarditis (IE) is rare, with the typical population being individuals with a history of intravenous drug use and patients with a structurally abnormal heart.¹⁻³ IE exerts its deleterious effects via local tissue damage, immunologic response, and embolic events, particularly affecting the cerebral arteries.⁴ Although uncommon, septic emboli to the coronary arteries can cause myocardial infarction, and sudden death.³⁻⁵ Many different strategies for the management of coronary embolism have been reported, including antithrombotic therapy, thrombectomy, percutaneous coronary intervention (PCI), and surgical embolectomy.⁵ Here, we present a case of postpartum IE, with a rare acute coronary syndrome presentation due to the presence of a left main coronary artery embolization. The patient was successfully treated with early surgical thrombectomy and aortic valve replacement.

Case History

A 44-year-old woman presented to the hospital emergency room after the sudden onset of severe chest pain radiating to her back. This pain had lasted for an hour and had largely resolved when she was seen in the emergency department. The patient was 5 months postpartum, after a vaginal delivery, at the time of presentation, and her recovery period following delivery had been complicated by an episode of endometritis that was treated empirically with a 10-day course of cephalexin and metronidazole. Her past medical history was significant for only hypertension and asthma; she had no other risk factors for IE.

Physical Examination

On examination, the patient was tachycardic but hemodynamically stable: blood pressure 142/57 mm Hg; heart rate 99 beats per minute; respiration rate 16 breaths per minute, and oxygen saturation 100% on room air. The first and second heart sounds were appreciated, but no additional abnormalities, including aortic regurgitation murmur, were initially documented. The remainder of the examination was unremarkable. Her complete blood count, kidney function, and electrolytes were otherwise normal. Her D-dimer was negative (less than 230 ng/mL), and her high-sensitivity troponin levels were elevated (from 30 ng/L to 172 ng/L and 230 ng/L). An electrocardiogram showed sinus tachycardia with no ST-segment changes, and her chest radiograph was unremarkable.

Received for publication May 30, 2022. Accepted September 19, 2022.

Ethics Statement: This case report has adhered to the relevant ethical guidelines.

[‡]All authors contributed to the writing of this case report.

Corresponding author: Dr Amir Ravandi, Interventional Cardiology, St. Boniface Hospital, Rm Y3508, Bergen Cardiac Care Centre, 409 Tache Avenue, Winnipeg, Manitoba R2H 2A6, Canada. Tel.: 204-235-2315.

E-mail: aravandi@sbgh.mb.ca

See page 1098 for disclosure information.

Novel Teaching Points

- IE should be considered as a potential diagnosis for young patients with atypical presentation and a history of a recent serious infection.
- In the case of septic embolization of the aortic valve and coronary arteries in these patients, an early surgical intervention must be the treatment of choice.

Computed tomography of the chest revealed a 1.6-cm splenic aneurysm, a splenic infarct, pulmonary edema, and dilated pulmonary arteries. No acute aortic dissection was identified.

Differential Diagnosis

The computed tomography angiogram and D-dimer results ruled out aortic dissection and pulmonary embolism, respectively. Due to the rising troponin levels, a non-ST

segment elevation myocardial infarction was considered. Moreover, the patient was under recent significant stress due to an illness of her 5-month-old daughter and financial strains. Therefore, the differential diagnoses included acute coronary syndrome, stress-induced cardiomyopathy, peripartum cardiomyopathy, and spontaneous coronary artery dissection. While awaiting the remainder of her workup, the patient was initially treated for acute coronary syndrome.

Additional Investigations

A transthoracic echocardiogram demonstrated 2 additional masses on the tricuspid aortic valve: one on the right coronary cusp measuring 9 mm x 4 mm, and one on the noncoronary cusp measuring 4 mm x 10 mm (Fig. 1, A and B). Severe aortic regurgitation with pan-diastolic flow reversal in the descending aorta and abdominal aorta was observed. Other findings included a mildly dilated left ventricle with moderate eccentric hypertrophy, dilated atria with elevated atrial pressure, and moderate mitral regurgitation. Mild pulmonary hypertension was also suspected.

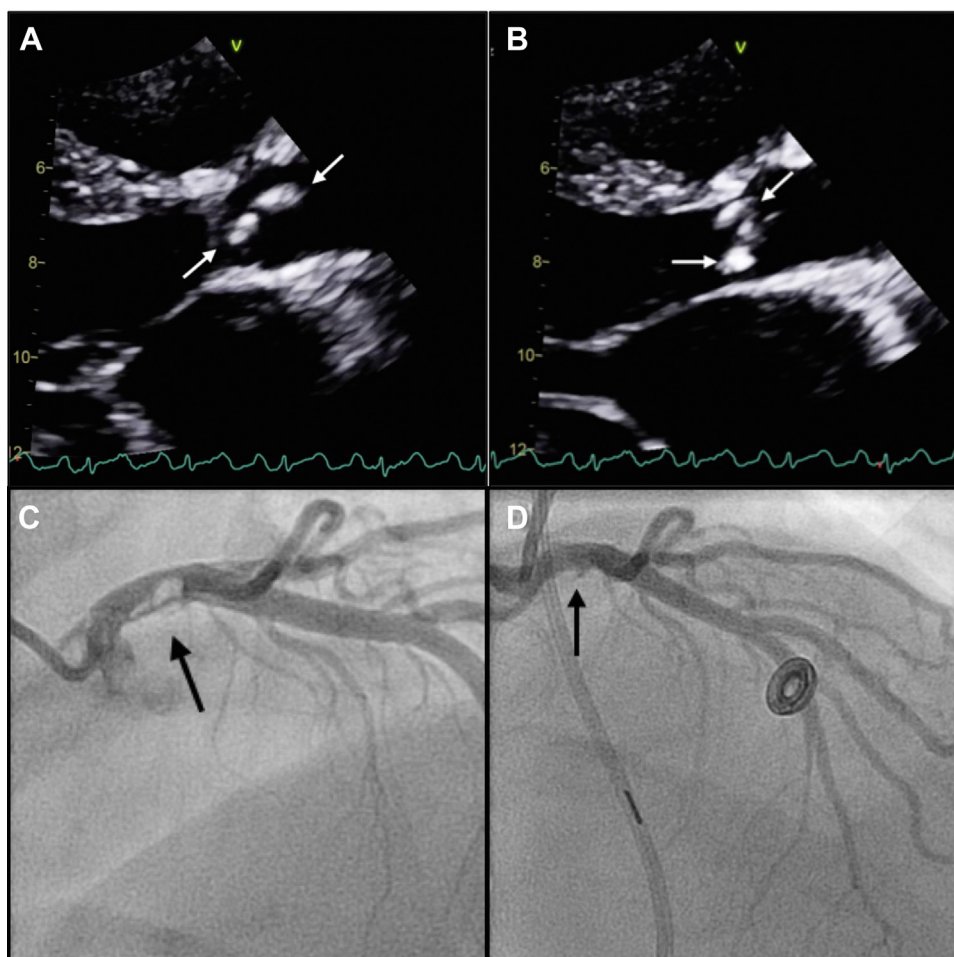


Figure 1. (A, B) Echocardiogram visualized 2 mobile vegetations on the right coronary and noncoronary cusps of the aortic valve (arrows). (C) Coronary angiogram shows distal left main lesion (arrow) due to the embolization of an aortic valve vegetation in the anterior-posterior cranial view. (D) Coronary angiogram of left coronary artery post-aortic valve replacement and surgical thrombectomy in anterior posterior cranial view, with arrow pointing to the resolved vegetation.

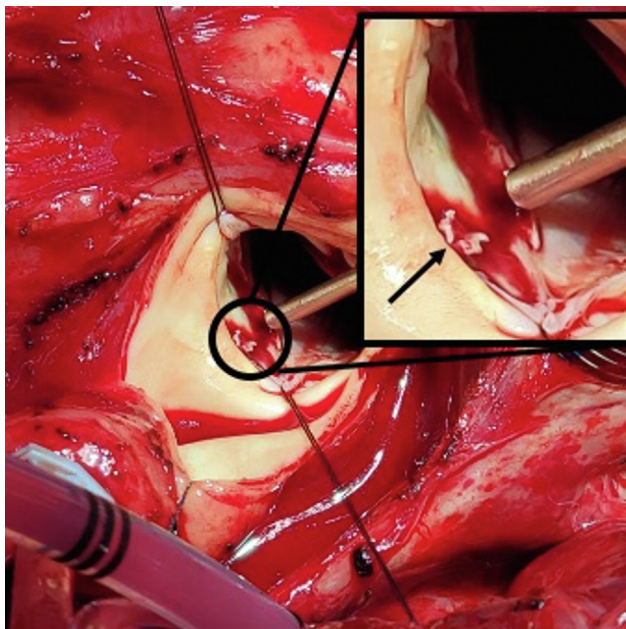


Figure 2. Intraoperative visualization of the vegetation at the ostium of the left coronary artery (**circle**). Inset shows **circled area** enlarged. The **arrow** points to the embolic material in the left main coronary artery ostium.

Coronary angiography demonstrated a luminal filling defect in the distal left main lesion (Fig. 1C). No other angiographic coronary artery disease was identified.

Treatment

After discovery of a left main coronary lesion, the patient was assessed by a cardiac surgeon and accepted for emergent operative intervention. Upon opening of the aorta, a large vegetation was visible sitting at the ostium of the left coronary artery (Fig. 2). This vegetation was removed with care to avoid any further embolization of vegetation down the left coronary system. The grossly infected aortic valve was removed, and the annulus was debrided. The aortic root was enlarged, and the valve was replaced successfully with a mechanical prosthesis. The patient was transferred to the intensive care unit in stable condition and then sent to the ward on postoperative day 5. Repeat angiography confirmed complete removal of the distal left main lesion, and no distal vessel was compromised (Fig. 1D). Culture results from the removed vegetation were negative, and her antibiotics were continued per the plan for a negative IE as suggested by the infectious diseases team. She was discharged home postoperatively with no additional complications.

Outcome and Follow-up

The patient was discharged on intravenous vancomycin and ceftriaxone for 30 days. Future follow-up with cardiac surgery and infectious diseases was arranged. An echocardiogram in 6 weeks was ordered.

Discussion

Coronary artery embolism is a rare complication of IE that can develop in up to 20%-50% of the cases if the

infection remains untreated.⁶ Septic embolization to the coronaries in the setting of IE has been treated using thrombolytic agents, aspiration thrombectomy, PCI, surgical intervention, and hybrid therapy involving transcatheter aspiration followed by surgical valvular intervention.⁶ The Infectious Disease Society of America has recommended a combination of medical and surgical interventions for these cases, yet there is an increasing trend favouring early surgical intervention due to the reduced risk of repeated embolic events while awaiting surgery.^{6,7}

Although PCI intervention is less invasive and has a shorter recovery time, it has the potential for microbial seeding of the stent, distal occlusion of coronary arteries by mobile emboli, and mycotic aneurysm development at the PCI balloon dilation site.⁸ Surgical intervention provides an opportunity for removal of all vegetation and of the main burden of infection, allowing for successful antimicrobial treatment. However, such intervention comes with a risk of bleeding, stroke, thoracotomy, and prosthetic valve replacement.^{7,8} The most suitable intervention for IE with septic emboli is still controversial.⁵ Yanagawa et al. suggest earlier surgical intervention, especially for patients with neurologic complications, despite the risk of hemorrhagic transformation associated with cardiac surgery.⁷ In their report, Bitay et al. emphasize the significance of using hybrid methods for patients with coronary artery septic embolization due to IE.⁶ This is while, Maqsood et al. suggest that aspiration thrombectomy is a feasible and safe choice for cases of IE complicated with septic emboli.⁸ In our case, surgery was indicated on the basis of severe aortic insufficiency, and large aortic vegetations with splenic and left main emboli.

What makes this case unique is that although our patient had no traditional risk factors for the development of IE, or important signs such as fever, her history of postpartum endometritis was significant enough to cause suspicion of an atypical infectious cause of IE. Additionally, this case demonstrated that aspiration of septic coronary embolization can be performed during aortic valve replacement surgery with no distal vascular embolization. The emboli were successfully removed, and the valve was replaced with a mechanical prosthesis. Notably, the risks of future pregnancies along with contraceptive plans should be discussed with the patient prior to deployment of a mechanical valve.

Conclusion

This case demonstrates the need for a high index of suspicion, and the utility of multimodality imaging along with a multidisciplinary approach to complex IE patients, to develop an optimal management plan for each patient. Early surgical intervention is often necessary in patients with IE with coronary embolization, resulting in a large ongoing myocardial territory at risk.

Funding Sources

The authors have no funding sources to declare.

Disclosures

The authors have no conflicts of interest to disclose.

References

1. Morelli MK, Veve MP, Shorman MA. Maternal bacteremia caused by *Staphylococcus aureus* with a focus on infective endocarditis. *Open Forum Infect Dis* 2020;7:ofaa239.
2. Montoya ME, Karnath BM, Ahmad M. Endocarditis during pregnancy. *South Med J* 2003;96:1156-7.
3. Kebed KY, Bishu K, Al Adham RI, et al. Pregnancy and postpartum infective endocarditis: a systematic review. *Mayo Clin Proc* 2014;89:1143-52.
4. Hewarathna UI, Karunaratne SP, Tennakoon R, et al. Septic embolization of left and right coronary arteries resulting in sudden death: a rare complication of infective endocarditis. *J Cardiol Cases* 2014;10:22-4.
5. Roux V, Salaun E, Tribouilloy C, et al. Coronary events complicating infective endocarditis. *Heart* 2017;103:1906-10.
6. Bitay M, Varga S, Babik B, Havasi K, Szücsborus T. Infective endocarditis complicated with coronary artery septic embolization: Is it worth to be mentioned? Case presentation and review of the literature. *Rev Cardiovasc Med* 2019;20:35-9.
7. Yanagawa B, Pettersson GB, Habib G, et al. Surgical management of infective endocarditis complicated by embolic stroke: practical recommendations for clinicians. *Circulation* 2016;134:1280-92.
8. Maqsood K, Sarwar N, Eftekhari H, Lotfi A. Septic coronary artery embolism treated with aspiration thrombectomy: case report and review of literature. *Tex Heart Inst J* 2014;41:437-9.